We claim:

1. A scintillator crystal comprising cerium doped lutetium yttrium orthosilicate.

2. The crystal of Claim 1 having the general composition of $Ce_{2x}(Lu_{1-y}Y_y)_{2(1-x)}SiO_5$ where x = approximately 0.00001 to approximately 0.05 and y = approximately 0.0001 to approximately 0.9999.

3. The crystal of Claim 1 having a monocrystalline structure.

4. The crystal of Claim 2 wherein x ranges from approximately 0.0001 to approximately 0.001 and y ranges from approximately 0.3 to approximately 0.8.

5. A scintillation detector assembly comprising:

a cerium doped lutetium yttrium orthosilicate crystal; and,

a photon detector coupled to said crystal, whereby an electrical signal is generated in response to a light pulse from said crystal when exposed to a high energy gamma ray.

6. The detector assembly of Claim 5 wherein said crystal is monocrystalline cerium doped lutetium yttrium orthosilicate.

7. The detector assembly of Claim 6 wherein said crystal has the general composition of $Ce_{2x}(Lu_{1-y}Y_y)_{2(1-x)}SiO_5$ where x = approximately 0.00001 to approximately 0.05 and y = approximately 0.0001 to approximately 0.9999.

8. The detector assembly of Claim 7 wherein x ranges from approximately 0.0001 to approximately 0.001 and y ranges from approximately 0.3 to approximately 0.8.

9. The detector assembly of Claim 5 wherein said coupled photon detector is selected from at least one of a photomultiplier tube, a PIN diode and an APFD diode.